Attachment 8

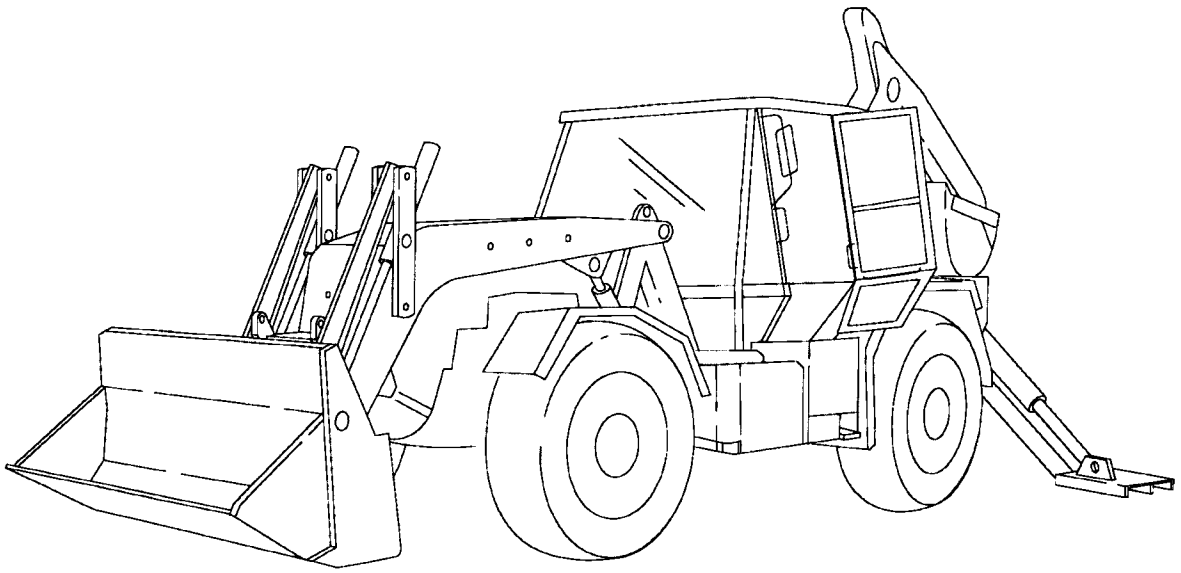
Table of Contents for Example TM Pages

TM 5-2420-230-24-1

TECHNICAL MANUAL

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL FOR INTERIM HIGH-MOBILITY ENGINEER EXCAVATOR (IHMEE)

NSN XXXX-XX-XXX-XXXX



Approved for public release; distribution unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY **OCTOBER 2003**

WARNING

Adhesives, solvents, and sealing compounds burn easily and give off vapors that are harmful to the skin and clothing. To avoid injury or death, keep away from open fire when using these materials, and use only in well-ventilated areas. If adhesives, solvents, or sealing compounds contact the skin or clothing, wash immediately with soap and water, and rinse thoroughly. Failure to comply may result in injury or death to personnel.

WARNING

All fuels, most lubricants, and some coolants are flammable. Do not store flammable fluids in cab. Failure to comply may result in injury or death to personnel.

WARNING

Always replace hoses with appropriate parts to prevent hoses from bursting. Failure to comply may result in injury or death to personnel.

WARNING

Always securely support vehicle if required to work under it. Failure to comply may result in injury or death to personnel.

WARNING

Always use caution if a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, release it slowly in a well-ventilated area.

WARNING

Avoid contact with hot oil. Failure to comply may result in serious injury.

WARNING

Contact with refrigerant can cause frostbite. Keep hands and face away to prevent personal injury.

WARNING

Death or serious injury may result if you attempt to mount or stop a moving vehicle.

TECHNICAL MANUAL
NO. 5-2420-230-24-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 01 OCT 2003

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL FOR XXXX

NSN XXXX-XX-XXX-XXXX

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Recommended Changes to Publications and Blank Forms) through the Internet on the Army Electronic Product Support (AEPS) Web site. The Internet address is http://aeps.ria.army.mil. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax, or e-mail your letter or DA Form 2028 directly to: AMSTA-LC-CI / TECH PUBS, TACOM-RI, 1 Rock Island Arsenal, IL 61299-7630. The e-mail address is TACOM-TECH-PUBS@ria.army.mil. The fax number is (DSN) 793-0726 or Commercial (309) 782-0726.

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Table of Contents

PURPOSE OF MANUAL.

The information in this manual is designed to help maintain the Interim High-Mobility Engineer Excavator (IHMEE) vehicle. It is intended to serve as a guide to assist qualified mechanics in the maintenance of the vehicle. In addition to this manual, refer to TM 5-2420-230-24P for any required parts information.

HOW TO USE THIS MANUAL.

Listed below are some of the features included in this manual to help locate and use the needed information:

- Each chapter begins with a Table of Contents listing all paragraph headings in the chapter.
- Warning, caution, note, and subject headings and other essential information are printed in bold type, making them easier to see.
- The maintenance tasks describe what must be done to the vehicle before starting the task, and what must be done to return the vehicle to operating condition after the task is finished.
- The appendixes are located at the end of the manual. They contain a reference guide to other manuals, guidelines to reading the Maintenance Allocation Chart (MAC), a list of expendable supplies and materials, towing procedures, and torque values.
- Several vendor manuals have also been included as appendixes. Appendixes in this volume include those for the backhoe, axles, steering pump, and vane pump/motor. Each vendor manual has a supplement showing task boxes relating to each maintenance task.
- Refer to TM 5-2420-230-24-2 for engine vendor manuals and foldout schematics.

The manual is divided into chapters containing Unit, Direct Support, and General Support maintenance procedures. These procedures describe a number of things, such as:

- What will be needed to do the job.
- If any assistance will be needed.
- How long the job will take.
- Important safety precautions.

In addition to the text, there will be illustrations for most procedures. These illustrations are keyed to the text and shows you how to take the part off and put it on. Cleaning and inspection procedures are also included when required.

Follow these guidelines when using this manual:

- Read all WARNINGS and CAUTIONS before performing any procedure.
- Become familiar with the entire maintenance procedure before beginning a maintenance task.

3-3. PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

a. Do the before (B) PREVENTIVE MAINTENANCE just before operating vehicle. Pay attention to the CAUTIONS and WARNINGS.

b. Do the during (D) PREVENTIVE MAINTENANCE while vehicle and/or its component systems are in operation. Pay attention to the CAUTIONS and WARNINGS.

c. Do the after (A) PREVENTIVE MAINTENANCE right after operating vehicle. Pay attention to the CAUTIONS and WARNINGS.

d. Do the (M) PREVENTIVE MAINTENANCE once a month. Pay attention to the CAUTIONS and WARNINGS.

e. If something does not work, troubleshoot with instructions in Para 3-12 and notify the supervisor.

f. Always do PREVENTIVE MAINTENANCE in the same order until it gets to be habit. Once practiced, problems can be spotted in a hurry.

g. If something looks wrong and cannot be fixed right then, write it on DA Form 2404 or DA Form 5988-E. If something seems seriously wrong, report it to Unit maintenance RIGHT NOW.

h. When doing PREVENTIVE MAINTENANCE, take along the tools needed and a rag (Item 8, Appendix D) or two to make all the checks.

3-4. GENERAL MAINTENANCE PROCEDURES.

WARNING

- APPROVED HEARING PROTECTION MUST BE WORN by operator, passenger, and any personnel within 22 ft. (7 m) of an IHMEE at high idle or within 12 ft. (4 m) of an IHMEE at low idle. Personnel hearing can be PERMANENTLY DAMAGED if exposed to constant high noise levels of 85 dB (A) or greater. Personnel exposed to high noise levels shall participate in a hearing conservation program in accordance with TB MED 501. Hearing loss occurs gradually but becomes permanent over time. Failure to comply may cause impairment or loss of hearing.
- Degreasing Solvent (MIL-PRF-680) is toxic and flammable. Keep away from heat or flame. Never smoke when using solvent. The flashpoint for Type II Degreasing Solvent is 141 °F (61 °C). Wear protective goggles, face shield, and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and do not breathe vapors. Failure to comply may result in injury or death to personnel.
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention.
- Adhesives, solvents, and sealing compounds burn easily and give off vapors that are harmful to the skin and clothing. To avoid injury or death, keep away from open fire when using these materials, and use only in well-ventilated areas. If adhesives, solvents, or sealing compounds contact the skin or clothing, wash immediately with soap and water, and rinse thoroughly. Failure to comply may result in injury or death to personnel.

a. Cleanliness. Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Use degreasing solvent (Item 9, Appendix D) on all metal surfaces.

b. Bolts, Nuts, and Screws. Check bolts, nuts, and screws for obvious looseness or missing, bent, or broken condition. Look for chipped paint, bare metal, or rust around boltheads. If any part seems loose, tighten it, or report it to Unit maintenance.

c. Welds. Look for loose or chipped paint, rust, or gaps where parts are welded together. If a bad weld is found, report it to Unit maintenance.

d. Electric Wires and Connectors. Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and ensure wires are in good shape. If a bad wire or connector is found, report it to Unit maintenance.

e. Hydraulic Lines and Fittings. Look for wear, damage, and leaks, and ensure clamps and fittings are tight. Wet spots show leaks, and a stain around a fitting or connector can mean a leak. If a leak comes from a loose fitting or connector, tighten it. If something is broken or worn out, report it to Unit maintenance.

f. Damage. Damage is defined as any conditions that affect safety or would render the vehicle unserviceable for mission requirements.

g. Lubrication. When performing lubricating tasks, have clean rags (Item 8, Appendix D), a clean grease gun (Item 7, Appendix B), and the proper lubricant (Para 3-10) for the climate in which IHMEE will be operating.

3-5. FLUID LEAKAGE.

It is necessary to know how fluid leakage affects the status of fuel, oil, coolant, and the hydraulic systems. The following are definitions of the different types/classes of leakage that determine the status of the vehicle. Learn them, then be familiar with them. REMEMBER – WHEN IN DOUBT, NOTIFY THE SUPERVISOR!

CAUTION

Equipment operation is allowable with minor leakage (Class I or II). Consideration must be given to the fluid capacity in the item/system being checked/inspected. When in doubt, notify the supervisor. When operating with Class I or II leaks, continue to check fluid levels as required in the PMCS. Class III leaks should be reported to the supervisor or to Unit maintenance. Failure to comply may result in damage to equipment.

a. Class I. Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

b. Class II. Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/ inspected.

c. Class III. Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

3-6. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES TABLE.

a. General.

NOTE

Prior to performing your PMCS, check with your PLL clerk to verify that the latest publications are being used by the operator and Unit maintenance.

Table 3-1 covers items on the IHMEE vehicle.

b. Daily "Walk Around" PMCS Diagram. This routing diagram will be of help to complete the B, D, or A PMCS. It shows the general sequence in which the PMCS is to be performed.

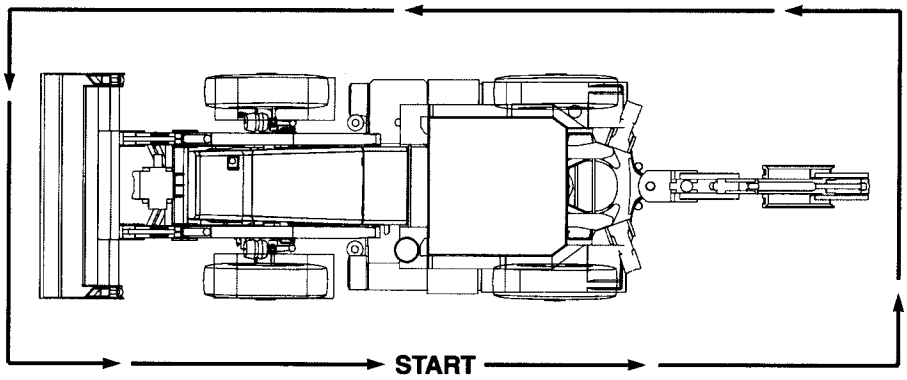

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Table 3-1. Operator/Crew Preventive Maintenance Checks and Services (PMCS) for IHMEE.

Item No.	Interval	Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
			CAUTION If any faults are found when operating hydraulic, electrical, or fuel components, notify Unit maintenance.	
1	Before	Exterior	Look under IHMEE for signs of fluid leakage (fuel, oil, and coolant).	Any leakage of fuel or Class III leakage of oil or coolant is found.

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services (PMCS) for IHMEE. (Continued)

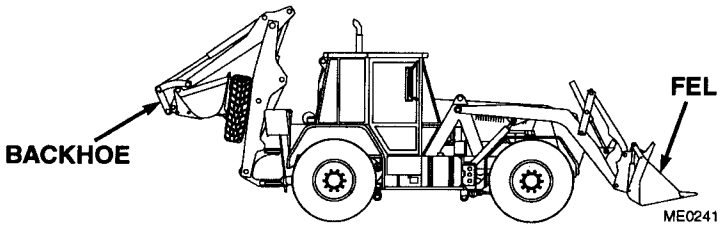
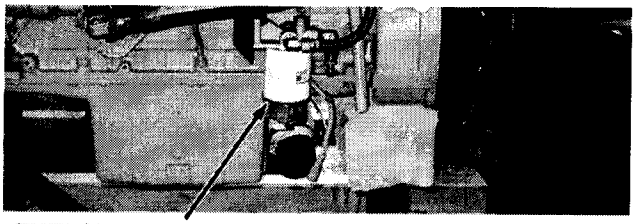
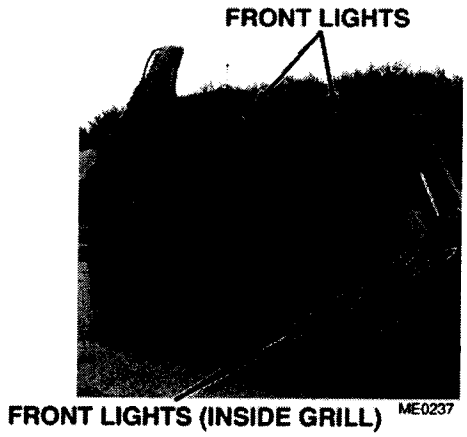
Item No.	Interval	Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
2	Before	Tires and Wheels	a. Visually inspect tires for proper inflation. Check pressure of any tire that looks low (Para 3-17).	Tires will not hold air.
			b. Check for obvious damages such as cuts, gouges, abrasions, cracks, leaks, bulges, or damage that extends to the cord body.	Any tires have cuts, gouges, abrasions, cracks, leaks, bulges, or damage that exposes cord body.
			c. Check for loose or missing lug nuts or broken studs.	One or more lug nuts are loose or missing. One or more studs are broken off.
3	Before	Front-End Loader (FEL) and Backhoe		
				
			Verify all safety travel bars, locking devices, safety pins, and latches are present and implements are securely locked in travel position (Para 6-2 and Para 7-6).	Travel bars, locking devices, or safety pins are missing or damaged, or latches not locked.
4	Before	Fuel/Water Separator		
				
			a. Open engine hood (Para 3-14).	
			b. Check fuel/water separator for water or excessive debris in sediment bowl. Drain water if present (Para 3-21).	Excessive debris in sediment bowl.
			c. Check fuel/water separator for fuel leaks.	Fuel leak present.

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services (PMCS) for IHMEE. (Continued)

Item No.	Interval	Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
8	Before	Windshield Wipers	**CAUTION** Do not operate wipers on dry windshield for extended periods of time. Failure to comply may result in equipment damage. a. Check windshield wiper operation. b. Check operation of front and rear windshield wiper washers. Keep wiper washer fluid reservoir full (Item 2, Appendix D). c. Close engine hood (Para 3-14).	Front wipers inoperative.
9	Before	Warning and Indicator Lights	**NOTE** • Do not allow engine to start during this check. • Refer to Table 4-1 for description and location of warning and indicator lights. a. Turn ignition switch to IGN position; observe warning and indicator lights. b. Return ignition switch to OFF position.	Warning or indicator lights do not illuminate.
10	Before	All Lights		
			Check lights for operation and broken lenses (if tactical situation permits).	Lights inoperative.



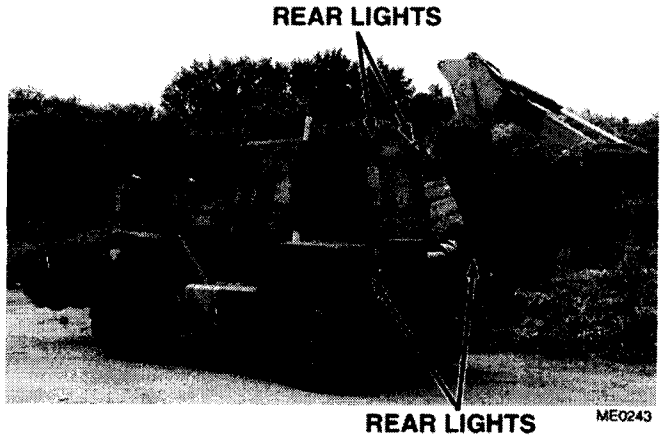


Table 3-1. Operator/Crew Preventive Maintenance Checks and Services (PMCS) for IHMEE. (Continued)

Item No.	Interval	Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
		Gauges and Warning Indicators — Continued	c. Normal engine oil pressure is 30-90 psi (207-621 kPa). Minimum oil pressure allowable at idle is 10 psi (69 kPa).	Engine oil pressure less than 10 psi (69 kPa).
			d. VOLTMETER in safe zone, 26-28.5 V.	VOLTMETER not in safe zone.
			e. Transmission oil temperature should not exceed 250 °F (121 °C).	Transmission oil temperature exceeds 250 °F (121 °C).
			f. DUAL BRAKE PRESSURE gauge should read between 75-110 psi (517-758 kPa).	DUAL BRAKE PRESSURE gauge reads below 75 psi (517 kPa) or above 110 psi (758 kPa).
14	During	Inclinometer	Check inclinometer for proper operation.	Inclinometer not operating properly.
15	During	AIR FILTER RESTRICTION Gauge		
			Check AIR FILTER RESTRICTION gauge.	Gauge reads above 25 inH_2O (625 mmH_2O).
16	During	Systems Operation Check	a. Depress service brake pedal and check to ensure that pedal is firm and does not depress completely to the floor.	Pedal goes to the floor.

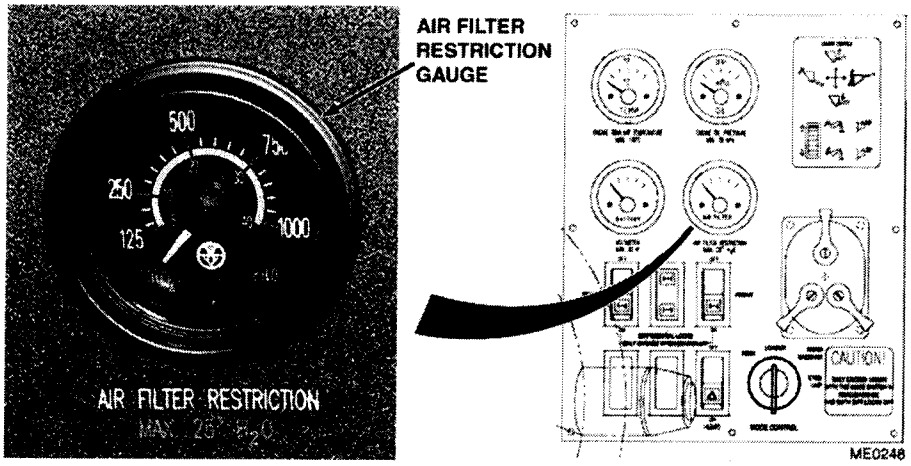


Table 3-1. Operator/Crew Preventive Maintenance Checks and Services (PMCS) for IHMEE. (Continued)

Item No.	Interval	Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
		Systems Operation Check — Continued	b. Place transmission in forward gear and allow vehicle to move. Operate the service brakes. Vehicle should stop.	Vehicle does not stop.
			c. With PARK BRAKE lever ON, place travel select control lever in second gear. Vehicle should not move.	Parking brake does not hold vehicle.
17	During	Steering	Check for any unusual steering noise, binding, or difficulty in turning.	Steering binds or is unresponsive.
18	During	Accelerator and Throttle Control	a. Check accelerator for proper operation.	Accelerator not working properly.
			b. Check hand throttle for proper operation (Para 4-13).	Hand throttle not working properly.
19	During	Transmission	Shift transmission in all ranges (Para 5-4); observe any unusual stiffness or binding.	Transmission does not operate.
20	During	Drive Line	Listen for unusual noises or vibrations.	Unusual noises or vibrations are present.
			WARNING If a maintenance procedure must be performed with the engine running, do not leave vehicle unattended. Failure to comply may result in injury or death.	
			CAUTION Do not operate engine at low idle for long periods (more than 10 min.). Operating engine for long periods at low idle may result in damage to equipment.	
			NOTE Park vehicle (Para 5-13) and leave engine running while performing checks 21 through 32d.	
21	After	Horn	Check that horn sounds when horn switch is pressed (if tactical situation permits).	Horn does not sound.

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services (PMCS) for IHMEE. (Continued)

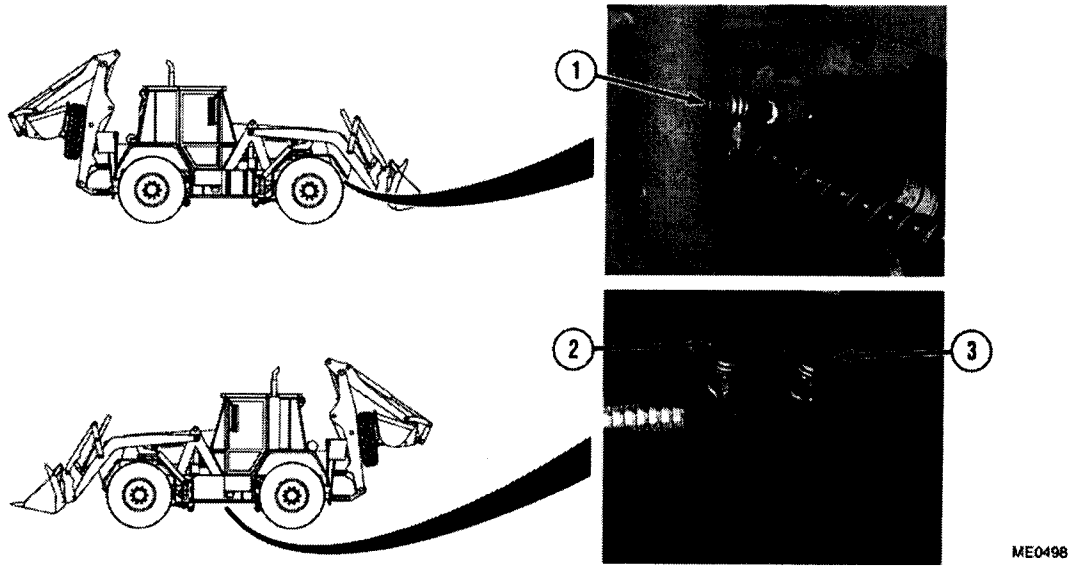
Item No.	Interval	Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
22	After	Fire Extinguisher	a. Check for proper charge level. b. Check mounting bracket for loose or missing hardware.	Not properly charged or missing.
23	After	Operator's and Passenger Seats and Seat Belts	a. Check operator's and passenger seat belts for damage. b. Check operator's seat adjustment latch. c. Check operator's seat suspension adjuster. d. Check operator's and passenger seats for damaged upholstery, loose or missing hardware, and ease of operation.	Either seat belt torn or belt retractor inoperative. Seat latch inoperative or broken. Seat adjuster inoperative or broken. Operator's or passenger seat hardware loose or missing.
24	After	Instrument Panel Lights	Move lights switch through all positions and check that instrument panel lights are functioning properly (refer to Table 4-4).	Instrument panel lights do not illuminate (if mission is to occur during low light or night time).
25	After	Instrument Panels and Controls	Inspect the instrument panels for broken glass and unserviceable gauges.	Any of the following gauges are unreadable: • ENGINE COOLANT TEMPERATURE • ENGINE OIL PRESSURE • TRANSMISSION OIL TEMPERATURE • TRANSMISSION OIL PRESSURE
26	After	Reverse Alarm	With ignition switch in IGN position, shift EGS to R (Reverse). Check reverse alarm operation (if tactical situation permits).	Reverse alarm inoperative.
27	After	Hourmeter	Check hourmeter for physical damage.	Hourmeter damaged.

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services (PMCS) for IHMEE. (Continued)

Item No.	Interval	Item to be Checked or Serviced	Procedure	Not Fully Mission Capable If:
		Differential and Axle Hub — Continued	m. Install plug and tighten. n. Repeat Steps k through m for rear axle housing. o. Stow wheel chocks.	
51	Monthly		a. Remove belly plates (Para 3-26) and firewall (Para 3-27). b. Perform monthly lubrication in accordance with Para 3-10. c. Install belly plates (Para 3-26) and firewall (Para 3-27).	

3-7. AOAP OIL SAMPLING VALVE LOCATIONS.

To ensure a new vehicle is being correctly lubricated, a sample of oil from each of the parts shown in the following list is to be taken, at 100 hours of operation or at 90-day intervals, whichever comes first, as prescribed by DA Pam 738-750. Hard-time intervals will be applied in the event AOAP laboratory support is not available. The components that require AOAP oil sampling are provided below.



(1) Engine

(2) Transmission

(3) Hydraulics system

APPENDIX B
COMPONENTS OF END ITEM (COEI)
AND BASIC ISSUE ITEMS (BII)

Section I. Introduction.

B-1. SCOPE.

This appendix lists components of the end item and basic issue items for the IHMEE to help you inventory the items for safe and efficient operation of the equipment.

B-2. GENERAL.

The COEI and BII lists are divided into the following sections:

a. ***Section II, Components of End Item.*** This listing is for information purposes only, and is not authority to requisition replacements. These items are part of the end item. As part of the end item, these items shall be with the end item when issued or transferred between property accounts. COEI are transferred between property accounts. Illustrations are furnished to help you find and identify the items.

b. ***Section III, Basic Issue Items.*** These essential items are required to place the IHMEE in operation, operate the IHMEE, and do emergency repairs. Although shipped separately packaged, BII must be with the IHMEE during operation and when the IHMEE is transferred between property accounts. This list is your authority to request/ requisition BII for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

B-3. EXPLANATION OF COLUMNS.

a. ***Column (1) - Illustration Number (Illus. No.).*** This column indicates the number of the illustration in which the item is shown. "NI" indicates that the item is not illustrated.

b. ***Column (2) - Part No.*** Indicates the part number assigned by the manufacturer to the item and may be used for requisitioning purposes when an NSN is not listed.

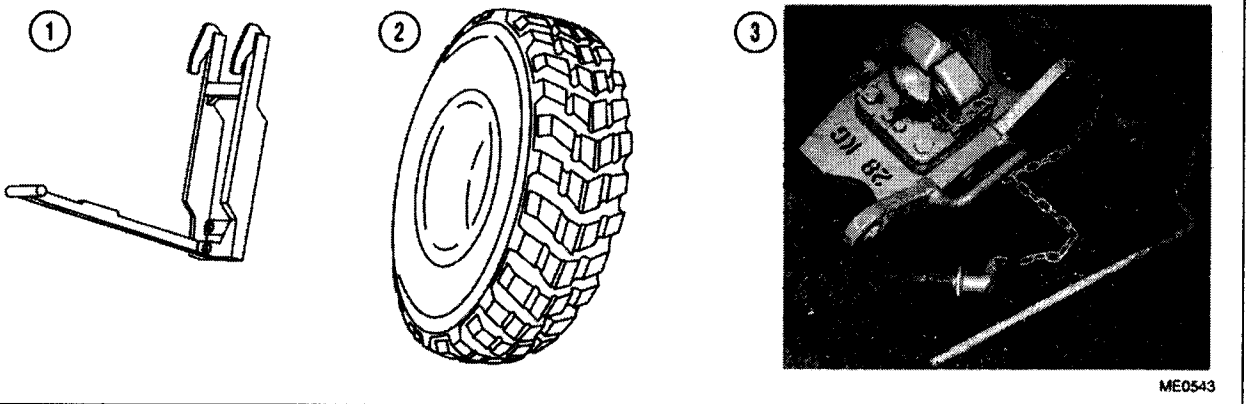
c. ***Column (3) - National Stock Number (NSN).*** Indicates the National Stock Number (NSN) assigned to the item and will be used for requisitioning purposes when available.

d. ***Column (4) - Description.*** Indicates the item name and, if required, a description to identify and locate the item.

e. ***Column (5) - Unit of Measure.*** Indicates the measure used in performing the actual operation or maintenance function. This measure is expressed by an alphabetical abbreviation (ea., in., per).

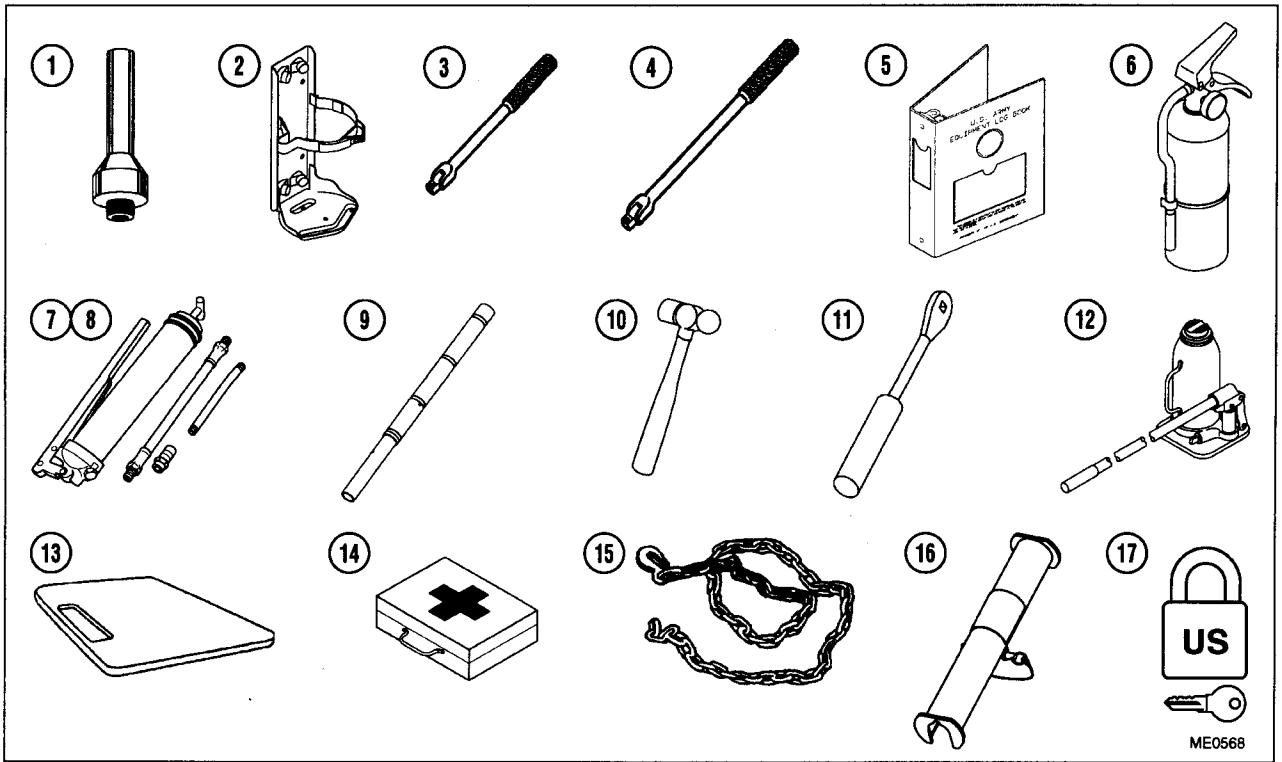
f. ***Column (6) - Quantity (Qty).*** Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. Components of End Item.



(1) Illus. No.	(2) Part No.	(3) NSN	(4) Description	(5) Unit of Measure	(6) Qty.
1	LTA-A05-303-001	2590-66-145-6870	Spare Tire Carrier Assembly	ea.	1
2	LTA-H03-004-001		Tire, Spare	ea.	1
3	LTA-A23-003-002		Tow Hitch Assembly	ea.	1

Section III. Basic Issue Items.



(1) Illus. No.	(2) Part No.	(3) NSN	(4) Description	(5) Unit of Measure	(6) Qty.
1	LTA60011	5325-66-147-5534	Adapter, Tire Valve, 6 - 10 mm	ea.	1
2	36037	4210-01-156-8098	Bracket, Fire Extinguisher	ea.	1
3	11655786-1	5120-00-236-7590	Breaker Bar, 1/2-in.	ea.	1
4	LTA60013	5120-66-016-2313	Breaker Bar, 3/4-in.	ea.	1
5	MIL-F-43986	7510-01-065-0166	Book, Log	ea.	1
6	79734	4210-01-133-9053	Extinguisher, Fire	ea.	1
7	1056-S4ANDA-908A	4930-00-640-4090	Grease Gun Assembly, 14 oz. (400 g)	ea.	1
8	M-10924-B	9150-01-197-7693	Grease Gun Cartridge, 14 oz. (400 g), GAA	ea.	1
9	LTA-A60-0008-01	3830-66-147-5499	Handle Assembly, Wheel Nut Torque	ea.	1
10	LTA60004	5120-66-010-8484	Hammer, Ball Peen 1-1/2 lb. (680 kg)	ea.	1
11	LTA60022	2590-66-147-5535	Hydraulic Valve Manual Override Lever	ea.	1
12	LTA60003	5120-66-147-5500	Jack, 5-Ton	ea.	1
13	LTA-A60-001-001	5120-66-147-5501	Jack Base Plate, Assembly	ea.	1
14	SC C-6545-IL VOL2	6545-00-922-1200	Kit, First Aid	ea.	1
15	LTA-A60-002-001	3950-66-147-5538	Lifting Chain Assembly 1,984 lb. (900 kg)	ea.	1
16	LTA-A20-035-001	2590-66-147-5536	Maintenance Arm, Front-End Loader (FEL)	ea.	1
17	5200 GL W/CHAIN	5340-00-158-3807	Padlock Set, 4-piece	ea	1

APPENDIX D
EXPENDABLE/DURABLES LIST

Section I. Introduction.

D-1. SCOPE.

This appendix lists expendable/durable supplies and materials needed to operate and maintain the Interim High Mobility Engineer Excavator (IHMEE). This listing is for informative purposes only and is not an authority to requisition listed items. These items are authorized to be used by CTA 50-970, Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

D-2. EXPLANATION OF COLUMNS.

a. Column (1), Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use Grease, Automotive and Artillery (GAA), Item 4, Appendix D").

b. Column (2), Level. This column identifies the Federal item name (in all capital letters), followed by a minimum description when needed.

C - Operator/Crew

c. Column (3), National Stock Number (NSN). This is the National Stock Number assigned to the item; use it to request or requisition the item.

d. Column (4), Description. Indicates the Federal item name, and, if required, a description to identify the item.

e. Column (5), Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by two-character alphabetical abbreviations (e.g., ea., in., pr.). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue to satisfy required measures.

Section II. Expendable and Durable Items.

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	C		Antifreeze, Multi-Engine Type, A-A-52624	
		6850-01-441-3218	Type I (EGAF), 1-gallon can	gal
		6850-01-441-3221	Type I (EGAF), 5-gallon can	gal
		6850-01-441-3223	Type I (EGAF), 55-gallon drum	gal
		6850-01-441-3234	Type IP (60% EGAF), 1-gallon can	gal
		6850-01-441-3240	Type IP (60% EGAF), 5-gallon can	gal
		6850-01-441-3248	Type IP (60% EGAF), 55-gallon drum	gal
2	C	6850-00-926-2275	Cleaning Compound,Windshield, (0FTT5) 0854-000	gal

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
3	C		Dexron III	
		9150-00-698-2382	1-quart can	qt
		9150-01-353-4799	1-quart bottle	qt
		9150-00-657-4959	5-gallon can	gal
		9150-01-114-9968	55-gallon drum	gal
4	C		Grease, Automotive and Artillery (GAA), MIL-PRF-10924	
		9150-01-197-7688	2.25-ounce tube	oz
		9150-01-197-7693	14-ounce cartridge	oz
		9150-01-197-7690	1.75-pound can	lb
		9150-01-197-7689	6.5-pound can	lb
		9150-00-190-0906	25-pound pail	lb
		9150-01-197-7692	35-pound can	lb
		9150-01-197-7691	120-pound can	lb
5	C		Oil, Lubricating, Gear, Multipurpose, (GO-), MIL-PRF-2105	
		9150-01-035-5390	GO-75, 1-quart can	qt
		9150-01-035-5391	GO-75, 5-gallon can	gal
		9150-01-035-5392	GO-80/90, 1-quart can	qt
		9150-01-313-2191	GO-80/90, 1-gallon can	gal
		9150-01-035-5393	GO-80/90, 5-gallon can	gal
		9150-01-035-5394	GO-80/90, 55-gallon drum	gal
		9150-01-035-5395	GO-85/140, 5-gallon can	gal
		9150-01-035-5396	GO-85/140, 55-gallon drum	gal
		9150-01-048-4591	GO-85/140, 1-quart can	qt
6	C		Oil, Lubricating, I-C Engine, Arctic, (OEA), MIL-PRF-46167	
		9150-00-402-2372	5-gallon can	gal
		9150-00-491-7197	55-gallon drum	gal
7	C		Oil, Lubricating, I-C Engine, Combat/Tactical Service, (OE/HDO-), MIL-PRF-2104	qt
		9150-00-189-6727	OE/HDO-10, 1-quart can	qt
		9150-01-177-3988	OE/HDO-10, 1-quart bottle	gal
		9150-00-186-6668	OE/HDO-10, 5-gallon can	gal
		9150-00-191-2772	OE/HDO-10, 55-gallon drum	gal
		9150-00-186-6681	OE/HDO-30, 1-quart can	qt
		9150-01-178-4726	OE/HDO-30, 1-quart bottle	qt
		9150-00-188-9858	OE/HDO-30, 5-gallon can	gal
		9150-00-189-6729	OE/HDO-30, 55-gallon drum	gal
		9150-00-188-9862	OE/HDO-40, 55-gallon drum	gal
		9150-01-152-4117	OE/HDO-15/40, 1-quart can	qt
		9150-01-178-4725	OE/HDO-15/40, 1-quart bottle	qt
		9150-01-152-4118	OE/HDO-15/40, 5-gallon can	gal
		9150-01-152-4119	OE/HDO-15/40, 55-gallon drum	gal
8	C	7920-00-205-1711	Rags, Wiping, 50 lb. bale, (A-A-531)	lb

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
9	C		Solvent, Degreasing, Type II (81348) MIL-PRF-680	
		6850-01-474-2319	1-gallon can	gal
		6850-01-474-2317	5-gallon can	gal
		6850-01-378-0698	15-gallon can	gal
		6850-01-474-2316	55-gallon drum	gal
10	C	4310-01-115-2297	Ties, Cable, (56501) TY525MX	ea.
11	C	9130-01-395-0945	Turbine Fuel, Aviation, Bulk, JP-8	gal

(11) Remove from safety stands and road test.

Section IV. Troubleshooting.

3-11. TROUBLESHOOTING INTRODUCTION.

This section contains step-by-step procedures for identifying, locating, isolating, and repairing equipment malfunctions. Troubleshooting is presented in a series of steps until the fault is fixed. In most cases, the step asks a question. It is followed by what to do if the condition is not met. If the condition is met, proceed to the next step.

3-12. TROUBLESHOOTING PROCEDURES.

a. General.

The Fault Symptom Index (Table 3-5) lists common malfunctions by vehicle system followed by tests, inspections, and corrective actions.

This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify the supervisor.

Before using troubleshooting tables, be sure all applicable Preventive Maintenance Checks and Services (PMCS) have been performed. Perform tests, inspections, and corrective actions in the order listed. Try to return the vehicle or component to operation after each test, inspection, and corrective action has been performed.

While doing troubleshooting, refer to any figures, foldouts, and publications mentioned in the text. These figures, foldouts, and additional publications will help isolate and locate troubles and get the vehicle back in service as quickly as possible. Foldout schematics are found in the second volume of this manual.

b. Measurements Required for Troubleshooting.

WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment and injury or death to personnel may occur.

CAUTION

Use properly sized test leads and ensure care is used when checking for resistance, continuity, or voltage at connectors, or damage to equipment may result.

(1) Resistance measurements.

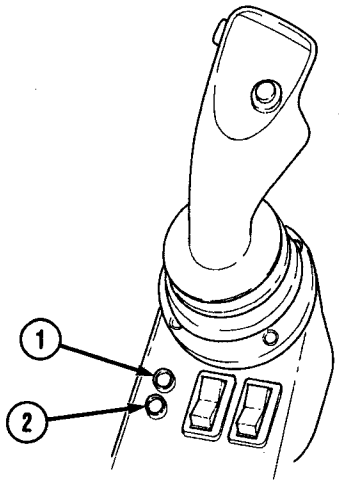
(a) Connect red test lead to Volt-Ohm input connector and black lead to COM input connector on meter.

(b) Set function/range switch to desired Ohm position. If the magnitude of the resistance is not known, set the switch to the highest range, then reduce until satisfactory reading is obtained.

3-13. HYDRAULIC CONTROLS ERROR CODES SPECIFICATION.

In the event of a malfunction, the electronic system performs a self-test and then provides a visual indication of likely faults to assist with fault diagnosis and rectification. The self-test checks the condition of all wiring, detectors, and internal, electronic logic in the control box.

A visual indication of error codes is given on the left-hand joystick control by a coded flashing of the loader indicator lamp (1) and the backhoe indicator lamp (2). The loader indicator lamp flashes to show the first digit of the two-digit error code, and the backhoe indicator lamp flashes to show the second digit. For example, if error code 48 is being displayed, both lamps flash four times to indicate first digit is "4," then the backhoe indicator lamp flashes another four times to indicate the second digit is "8."



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The hydraulic error codes are given in Table 3-3. For correction of all error codes, refer to TS table (Para 3-16) or appropriate maintenance task as indicated by the "LIKELY FAULT" column.

Table 3-3. Hydraulic Error Codes.

DEVICE	LIKELY FAULT	CODE	TYPE
System voltage	Voltage too low	48	1
	Voltage too high	49	1
Controller	Internal fault, diagnostic circuits	91	1
Right joystick wiring	4-in-1 potentiometer shorted to ground	32	2
	4-in-1 potentiometer shorted to ground	33	2
	Bucket potentiometer shorted to ground	34	2
	Bucket potentiometer shorted to ground	35	2
	Arms' potentiometer shorted to ground	36	2
	Arms' potentiometer shorted to ground	37	2
Left joystick wiring	Swing potentiometer shorted to ground	42	2
	Swing potentiometer shorted to ground	43	2
	Dipper potentiometer shorted to ground	44	2
	Dipper potentiometer shorted to ground	45	2
Load-holding valve solenoid	No connected load	51	2
Float valve section B	No connected load	52	2
Float valve section A	No connected load	53	2
Boom sensor wiring	Signal shorted to ground	12	3
	Signal shorted to power	13	3

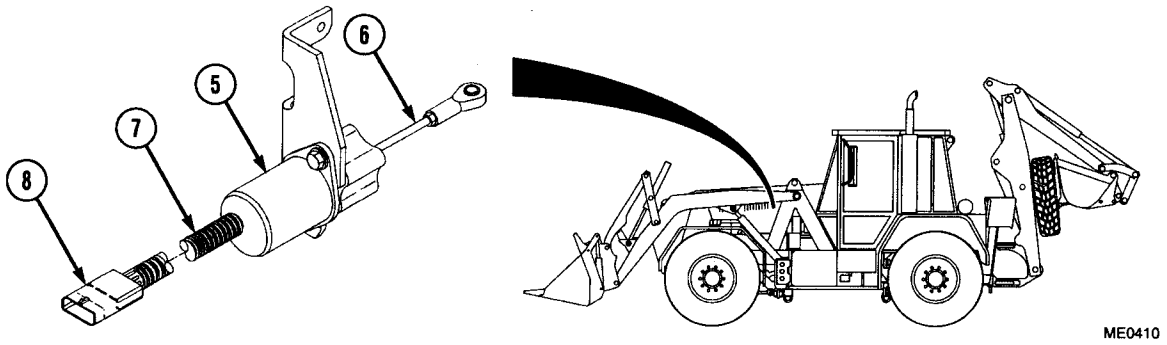
3-16. TROUBLESHOOTING TABLE.

Table 3-5. Fault Symptom Index.

Table 3-6. Unit Troubleshooting Table. — Continued

Malfunction
Test or Inspection
Corrective Action

ENGINE CRANKS BUT WILL NOT START. — CONTINUED



WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment and injury or death to personnel may occur.

Step 6. Check fuel shut-off solenoid (5) to ensure it is functioning properly.

If fuel shut-off solenoid arm (6) moves, notify Direct Support maintenance (Appendix L).

Step 7. Check wiring harness (7) for continuity and connector (8) for damage or short.

If wiring harness (7) does not have continuity, repair wiring harness (Para 12-28).

If connector (8) has damage or a short, repair connector (Para 12-28).

Step 8. Check wiring harness from fuel shut-off solenoid to power source for continuity.

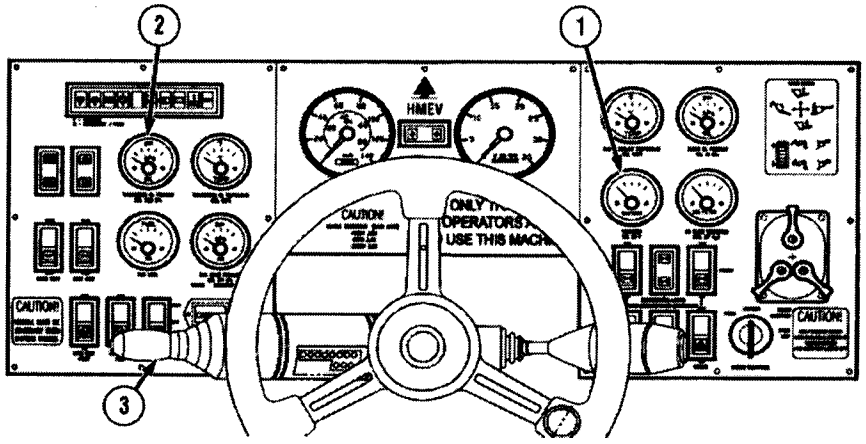
If wiring harness does not have continuity, repair wiring harness (Para 12-28).

If fault continues, notify Direct Support maintenance (Para L-26).

Table 3-6. Unit Troubleshooting Table. — Continued

Malfunction Test or Inspection Corrective Action

12. TRANSMISSION FAILS TO SHIFT OR SHIFTS ERRATICALLY.



Step 1. Check VOLTMETER gauge (1).

If gauge (1) reads less than 20 Vdc, check electrical master switch. Replace electrical master switch if necessary (Para 12-8).

Step 2. Check TRANSMISSION OIL PRESSURE gauge (2).

If gauge (2) reads less than 235 psi (1 620 kPa), check gauge for proper operation. Replace if necessary (Para 12-23).

Step 3. Check circuit breaker CB-18 in the Power Distribution Panel (PDP) (refer to FO-1).

If circuit breaker CB-18 is tripped, reset circuit breaker.

WARNING

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry or tools contact positive electrical circuits, a direct short may result. Damage to equipment and injury or death to personnel may occur.

Step 4. Check for continuity on wire 360 from circuit breaker CB-18 to Electronic Gear Shift (EGS) (3) (refer to FO-3).

If there is not continuity, repair wire 360 (Para 12-28).

CHAPTER 7
FUEL SYSTEM

Contents

7-1. GENERAL.

This section details routine maintenance activities and removal and replacement procedures for the following components:

- Fuel filters
- Fuel tank
- Fuel tank breather

7-2. PREPARATION AND ISOLATION.

Prior to performing any maintenance on the Interim High-Mobility Engineer Excavator (IHMEE) vehicle, perform the following procedure:

(1) Ensure vehicle is positioned on level ground.

(2) Ensure parking brake is applied (TM 5-2420-230-10).

(3) Raise Front-End Loader (FEL), install maintenance arm, and lower FEL onto maintenance arm as required (TM 5-2420-230-10).

(4) Shut OFF engine (TM 5-2420-230-10).

(5) Place electrical master switch in OFF position (TM 5-2420-230-10).

(6) Attach "Do Not Operate" tag to ignition switch (TM 5-2420-230-10).

7-3. RESTORE IHMEE TO OPERATIONAL READINESS.

Upon completion of maintenance activities, restore power and return vehicle to operational readiness by doing the following:

(1) Place electrical master switch in ON position (TM 5-2420-230-10).

(2) Remove "Do Not Operate" tag from ignition switch (TM 5-2420-230-10).

(3) Ensure parking brake is applied (TM 5-2420-230-10).

(4) Start engine (TM 5-2420-230-10).

(5) Raise FEL, remove maintenance arm, and lower FEL to ground or travel position as required (TM 5-2420-230-10).

(6) Complete necessary documents and return IHMEE to relevant authority.

7-4. BLEEDING FUEL SYSTEM.

This Task Covers:

a. Bleeding

INITIAL SETUP

Test Equipment
None

Tools and Special Tools
Pan, drain, Item 29, Appendix B
Tool kit, general mechanics, Item 38, Appendix B

Materials/Parts
Cloth, lint-free, Item 10, Appendix C

Personnel Required
MOS 62B, Construction Equipment Repairer (2)

References
None.

Equipment Conditions

TM or Para	*Condition Description*
TM 5-2420-230-10	Hood raised.

Drawings Required
None

Estimated Time to Complete Task
Refer to MAC in Appendix B

a. Bleeding.

WARNING

- No smoking, flames, sparks, or glowing or hot objects are allowed within 50 ft. (15 m) of vehicle. Fire or explosion may cause personal injury or death.
- Fuel and oil are slippery and can cause falls. To avoid injury, wipe up spilled fuel or oil with rags.
- To prevent possible injury, wear gloves and protective eye equipment when handling fuel. Failure to comply may result in injury or death to personnel.

NOTE

If the engine does not start after a service or if the IHMEE has ran out of fuel, complete the following steps:

(1) Ensure fuel is present in tank.

(2) With the aid of an assistant, operate primer while starting engine.

NOTE

If engine fails to start, complete the following steps:

(3) Remove fuel bleeder screw from top of secondary fuel filter.

(4) Operate primer until a steady stream of fuel is visible, then install bleeder screw.

(5) With the aid of an assistant, operate primer while starting engine.

NOTE

If engine still fails to start, complete the following steps:

(6) Operate primer and loosen fuel injector lines at injectors.

(7) When fuel is visible, turn over engine and tighten fuel injector lines one at a time.

(8) If engine fails to start, replace fuel filters and go to Step (1).

b. Follow-On Maintenance.

(1) Close engine hood (TM 5-2420-230-10).

(2) Remove "Do Not Operate" tag from ignition switch (TM 5-2420-230-10).

END OF TASK

7-5. FUEL FILTER REPLACEMENT.

This Task Covers:

a. Primary Fuel Filter (Fuel/Water Separator) Removal
b. Secondary Fuel Filter Removal
c. Secondary Fuel Filter Replacement
d. Primary Fuel Filter (Fuel/Water Separator) Replacement
e. Follow-On Maintenance

INITIAL SETUP

Test Equipment
None

Tools and Special Tools
Pan, drain, Item 29, Appendix B
Tool kit, general mechanics, Item 38, Appendix B

Materials/Parts
Cloth, lint-free, Item 10, Appendix C
Turbine Fuel, Aviation, JP-8, Item 69, Appendix C

Personnel Required
MOS 62B, Construction Equipment Repairer

References
None

Equipment Conditions

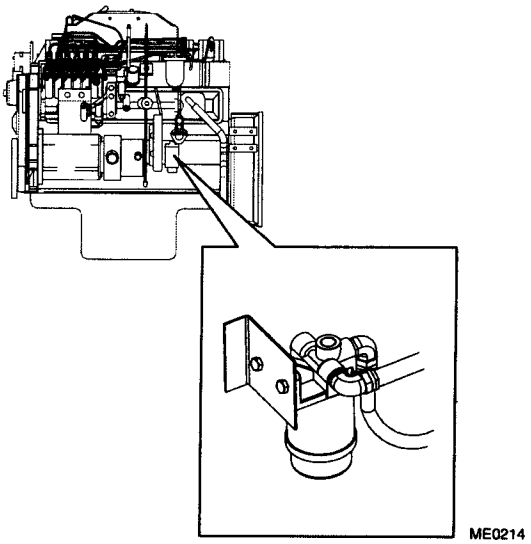
TM or Para	*Condition Description*
TM 5-2420-230-10	Vehicle positioned on level ground.
TM 5-2420-230-10	Parking brake applied.
TM 5-2420-230-10	Engine shut OFF.
TM 5-2420-230-10	Electrical master switch OFF.
TM 5-2420-230-10	"Do Not Operate" tag attached to ignition switch.
TM 5-2420-230-10	Hood raised.

Drawings Required

TM 5-2420-230-24P	Figure 16
TM 5-2420-230-24P	Figure 34

Estimated Time to Complete
Refer to MAC in Appendix B

a. Primary Fuel Filter (Fuel/Water Separator) Removal.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WARNING

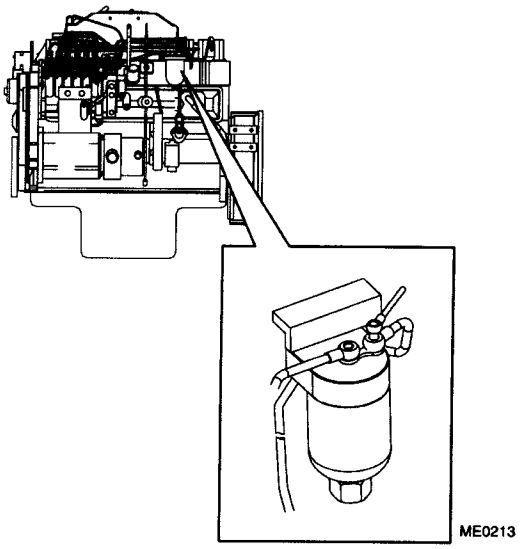
- No smoking, flames, sparks, or glowing or hot objects are allowed within 50 ft. (15 m) of vehicle. Fire or explosion may cause personal injury or death.
- Fuel and oil are slippery and can cause falls. To avoid injury, wipe up spilled fuel or oil with rags.
- To prevent possible injury, wear gloves and protective eye equipment when handling fuel. Failure to comply may result in injury or death to personnel.

(1) Place drain pan beneath primary filter.

(2) Remove knurled fastener securing glass bowl.

(3) Unscrew canister, drain fuel, and discard canister.

b. Secondary Fuel Filter Removal.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(1) Place suitable container beneath secondary filter.

(2) Remove secondary filter canister by unscrewing it counterclockwise. Discard filter element.

c. Secondary Fuel Filter Replacement.

(1) Coat secondary filter canister sealing gasket with fuel and position correctly.

(2) Install new secondary filter canister and fill with fuel.

(3) Prime fuel system by pumping primer button several times until resistance is felt. Primer is located just below secondary fuel filter.

d. Primary Fuel Filter (Fuel/Water Separator) Replacement.

(1) Coat primary filter canister sealing gasket with fuel and position correctly.

(2) Install new primary filter canister and fill with fuel.

(3) Prime fuel system by pumping primer button several times until resistance is felt. Primer is located just below secondary fuel filter.

b. Installation.

Steps in installation of muffler heat shield are the reverse of those in removal procedure.

c. Follow-On Maintenance.

Remove "Do Not Operate" tag from ignition switch (TM 5-2420-230-10).

END OF TASK

ARMY'S TWO LEVEL MAINTENANCE MAC HEADER

Prepare MAC in accordance with MIL-STD-40051B Change Notice 1.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND TEST EQUIPMEN	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			UNIT		DS	GS	DEPOT		
			C	O	F	H	D		

THE ARMY MAINTENANCE SYSTEM MAC

1. This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.
2. The MAC immediately following this introduction designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown in the MAC (WP 0223 00) in column (4) as:

   Field - includes subcolumns:

   C - Operator/Crew
   O - Unit
   D - Direct Support

   Sustainment - includes subcolumns:

   H - General Support
   D - Depot
3. The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.
4. The remarks (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

MAINTENANCE FUNCTIONS

Maintenance functions are limited to and defined as follows:

1. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).
2. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
3. **Service.** Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.
4. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.
5. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.
6. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
7. **Remove/Install.** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.
8. **Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.
9. **Repair.** The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

MAINTENANCE FUNCTIONS - CONTINUED

NOTE

The following definitions are applicable to the "repair" maintenance function:

- Services - Inspect, test, service, adjust, align, calibrate, and/or replace.
- Fault location/troubleshooting - The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).
- Disassembly/assembly - The step-by-step breakdown (taking apart) of a spare/functional group coded item and to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).
- Actions - Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

10. **Overhaul**. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

11. **Rebuild**. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

EXPLANATION OF COLUMNS IN THE MAC, TABLE 1

1. **Column (1) - Group Number**. Column (1) lists Group numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

2. **Column (2) - Component/Assembly**. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

3. **Column (3) - Maintenance Function**. Column (3) lists the functions to be performed on the item listed in Column (2). (For a detailed explanation of these functions refer to "Maintenance Functions" outlined above).

4. **Column (4) - Maintenance Level**. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating work time required (expressed as manhours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

Field:

C - Operator/Crew Maintenance
O - Unit Maintenance
D - Direct Support Maintenance

Sustainment:

H - General Support Maintenance
D - Depot Maintenance

MAINTENANCE FUNCTIONS - CONTINUED

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by a work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS CODE column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

5. **Column (5) - Tools and Equipment Reference Code.** Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.
6. **Column (6) - Remarks Code.** When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries (Table 3).

EXPLANATION OF COLUMNS IN THE TOOLS AND TEST EQUIPMENT REQUIREMENTS, TABLE 2

1. **Column (1) - Tool or Test Equipment Reference Code.** The tool and test equipment reference code correlates with a code used in column (5) of the MAC.
2. **Column (2) - Maintenance Level.** The lowest level of maintenance authorized to use the tool or test equipment.
3. **Column (3) - Nomenclature.** Name or identification of the tool or test equipment.
4. **Column (4) - National Stock Number (NSN).** The NSN of the tool or test equipment.
5. **Column (5) - Tool Number.** The manufacturer's part number, model number, or type number.

EXPLANATION OF COLUMNS IN THE REMARKS, TABLE 3

1. **Column (1) - Remarks Code.** The code recorded in column (6) of the MAC.
2. **Column (2) - Remarks.** This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

END OF WORK PACKAGE

TECHNICAL MANUAL
NO. 5-2420-230-24P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 01 OCT 2003

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST FOR INTERIM HIGH-MOBILITY ENGINEER EXCAVATOR (IHMEE)

NSN 2420-66-148-7692

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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TABLE OF CONTENTS

INTRODUCTION

SCOPE

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of unit, direct support, and general support maintenance of the IHMEE. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

GENERAL

In addition to the Introduction work package, this RPSTL is divided into the following work packages.

1. Repair Parts List Work Packages. Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed separately in their own functional group and work package. Repair parts for reparable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.

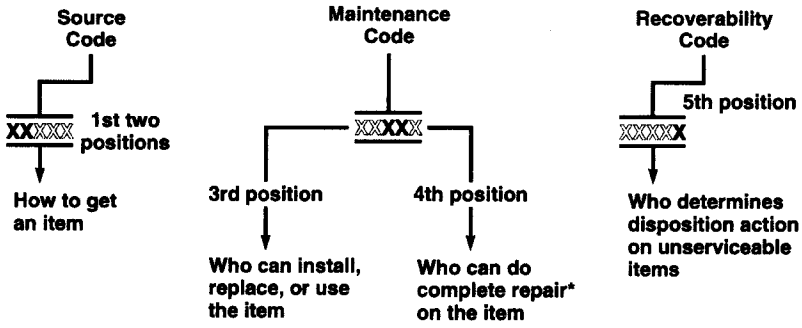
2. Special Tools List Work Packages. Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) column). Tools that are components of common tool sets and/or Class VII are not listed.

3. Cross-Reference Indexes Work Packages. There are two cross-reference indexes work packages in this RPSTL: the National Stock Number (NSN) Index work package and the Part Number (P/N) Index work package. The National Stock Number Index work package refers you to the figure and item number. The Part Number Index work package refers you to the figure and item number.

EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGES

ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column (2)). The SMR code contains supply/requisitioning information, maintenance level authorization criteria, and disposition instruction, as shown in the following breakout:



* Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

Source Code	Application/Explanation
PA	Stock items; use the applicable NSN to requisition/ request items with these source codes. They are authorized to the level indicated by the code entered in the 3rd position of the SMR code.
PB	
PC	
PD	
PE	
PF	
PG	

NOTE

Items coded PC are subject to deterioration.

KD	Items with these codes are not to be requested/ requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.
KF	
KB	

SourceCode		Application/Explanation
MO-	(Made at Unit/ AVUM Level)	
MF-	(Make at DS/ AVIM Level)	Items with these codes are not to be requisitioned/ requested individually. They must be made from bulk material which is identified by the P/N in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at higher level, order the item from the higher level of maintenance.
MH-	(Made at GS Level)	
ML-	(Made at Specialized Repair Act [SRA])	
MD-	(Made at Depot Level)	
AO-	(Assembled by Unit/AVUM Level)	
AF-	(Assembled by DS/AVIM Level)	Items with these codes are not to be requested/ requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.
AH-	(Assembled by GS Category)	
AL-	(Assembled by SRA)	
AD-	(Assembled by Depot Level)	
XA		Do not requisition an "XA" coded item. Order the next higher assembly. (Refer to NOTE below.)
XB		If an item is not available from salvage, order it using the CAGEC and P/N.
XC		Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's P/N.
XD		Item is not stocked. Order an XD-coded item through normal supply channels using the CAGEC and P/N given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes except for those items source coded "XA".

Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

Third Position. The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance:

Maintenance Code	Application/Explanation
C —	Crew or operator maintenance done within unit/AVUM maintenance.
O —	Unit level/AVUM maintenance can remove, replace, and use the item.
F —	Direct support/AVIM maintenance can remove, replace, and use the item.
H —	General support maintenance can remove, replace, and use the item.
L —	Specialized repair activity can remove, replace, and use the item.
D —	Depot can remove, replace, and use the item.

Fourth Position. The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (perform all authorized repair functions).

NOTE

Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Maintenance Code	Application/Explanation
O —	Unit/AVUM is the lowest level that can do complete repair of the item.
F —	Direct support/AVIM is the lowest level that can do complete repair of the item.
H —	General support is the lowest level that can do complete repair of the item.
L —	Specialized repair activity (enter specialized repair activity designator) is the lowest level that can do complete repair of the item.
D —	Depot is the lowest level that can do complete repair of the item.
Z —	Nonreparable. No repair is authorized.
B —	No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows:

Recoverability Code	Application/Explanation
Z —	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR code.
O —	Reparable item. When uneconomically reparable, condemn and dispose of the item at the unit level.
F —	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support level.
H —	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D —	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L —	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A —	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

NSN (Column (3)). The NSN for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

PART NUMBER (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different P/N from the number listed.

DESCRIPTION AND USABLE ON CODE (UOC) (Column (6)). This column includes the following information:

1. The federal item name, and when required, a minimum description to identify the item.
2. P/Ns of bulk materials are referenced in this column in the line entry to be manufactured or fabricated.
3. Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.
4. The statement END OF FIGURE appears just below the last item description in column (6) for a given figure in both the repair parts list and special tools list work packages.

QTY (Column (7)). The QTY (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

HOW TO LOCATE PARTS.

1. When NSNs or P/Ns Are Not Known.

   First. Using the table of contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

   Second. Find the figure covering the functional group or the subfunctional group to which the item belongs.

   Third. Identify the item on the figure and note the number(s).

   Fourth. Look in the repair parts list work packages for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

2. When NSN Is Known.

   First. If you have the NSN, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

   Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

3. When P/N Is Known.

   First. If you have the P/N and not the NSN, look in the PART NUMBER column of the P/N index work package. Identify the figure and item number.

   Second. Look up the item on the figure in the applicable repair parts list work package.

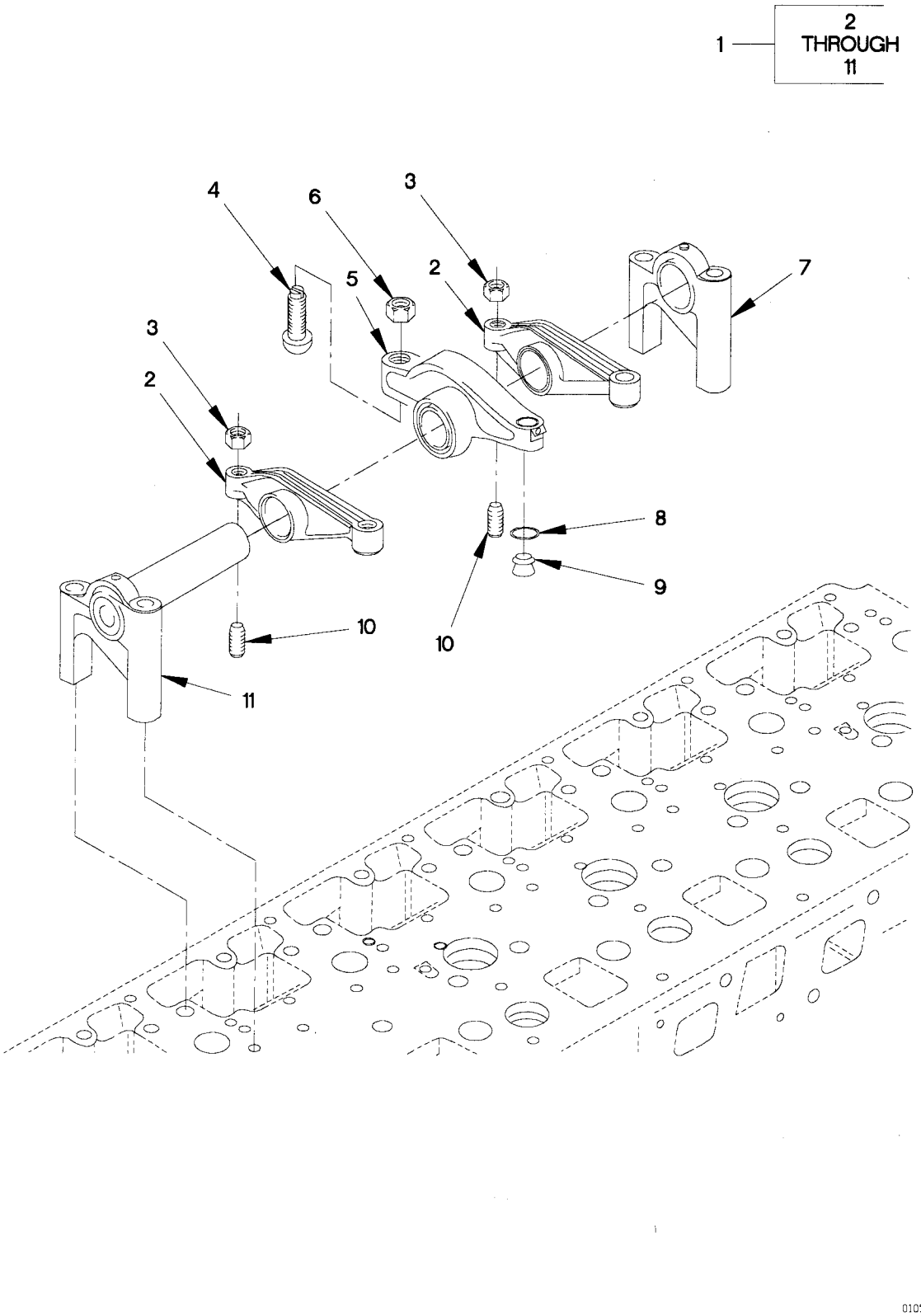


FIGURE 14. ROCKER ARMS

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				GROUP 0105: VALVES, CAMSHAFTS, AND TIMING SYSTEM	
				FIG.14 ROCKER ARMS	
1	PFFFF	11083	107-7722	ROCKER ARM ASSEMBLY.....	6
2	PAFZZ	11083	6I0924	.ROCKER ARM,ENGINE P.....	2
3	PAFZZ	11083	2Y5829	.NUT,PLAIN,HEXAGON.....	2
4	PAFZZ	11083	9Y4973	.SCREW,ADJUSTING,VAL.....	1
5	PAFZZ	11083	105-1776	.ROCKER ARM,ENGINE P.....	1
6	PAFZZ	11083	7W4117	.NUT,PLAIN,HEXAGON M12 X 1.25.....	1
7	PAFZZ	11083	9Y8534	.BRACKET,ROCKER ARM.....	1
8	PAFZZ	11083	7W3983	.RING,RETAINING.....	1
9	PAFZZ	11083	9Y1582	.BUTTON,ROCKER ARM A.....	1
10	PAFZZ	11083	9Y4832	.SCREW,ADJUSTING,VAL.....	2
11	PAFZZ	11083	4P7792	.BRACKET,EYE,ROTATIN.....	1

END OF FIGURE

APPENDIX A
REFERENCES

A-1. SCOPE.

This appendix lists forms, field manuals, technical manuals, and other publications either referenced in this manual or which apply to the operation and maintenance of the Interim High Mobility Engineer Excavator (IHMEE). Web sites which may be useful are also included in this appendix.

A-2. FIELD MANUALS.

FM 3-4	Nuclear, Biological, and Chemical (NBC) Protection
FM 3-5	Nuclear, Biological, and Chemical (NBC) Decontamination
FM 5-20	Camouflage Pattern Painting
FM 5-103	Survivability
FM 5-434	Earthmoving Operations
FM 9-207	Operations and Maintenance of Ordnance Material in Cold Weather (0 °F to -65 °F)
FM 20-22	Vehicle Recovery Operations
FM 20-30	Battle Damage Assessment and Repair
FM 21-11	First Aid for Soldiers
FM 21-40	NBC (Nuclear, Biological, and Chemical) Defense
FM 21-305	Manual for Wheel Vehicle Diver
FM 31-70	Basic Cold Weather Operation Manual
FM 31-71	Northern Operations
FM 90-3	Desert Operations (FM 7-727)

A-3. FORMS.

DA Form 2028	Recommended Changes to DA Publications and Blank Forms
DA Form 2404/5988-E	Equipment Inspection and Maintenance Worksheet/Electronic
DA Form 2408-9	Equipment Control Record
DA Form 5504	Maintenance Request
DD Form 250	Material Inspection and Receiving Report
DD 314	Preventive Maintenance Schedule and Records
SF 364	Report of Descrepancy
SF 368	Product Quality Deficiency Report

A-4. MISCELLANEOUS.

CTA 8-100	Army Medical Department Expendable/Durable Items
CTA 50-790	Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)
OSHA 1926.1001	Minimum Performance Criteria for Rollover Protective Structures for Designated Scrapers, Loaders, Dozers, Graders, and Crawler Tractors

A-5. PAMPHLETS.

DA PAM 738-750	Functional User's Manual for The Army Maintenance Management System (TAMMS)
DA PAM 40-501	Hearing Conservation Program

A-6. REGULATIONS.

AR 70-1	Army Acquisition Policy
AR 700-138	Army Logistics Readiness and Sustainability
AR 385-55	Prevention of Motor Vehicle Accidents

A-7. TECHNICAL BULLETINS.

TB 5-2420-230-14	Warranty Program for Interim High-Mobility Engineer Excavator (IHMEE)
TB 43-0142	Safety Inspection and Testing of Lifting Devices
TB 43-0209	Color, Marking, and Camouflage Painting of Military Vehicles
TB 43-0212	Purging, Cleaning, and Coating Interior Ferrous and Terne Sheet; Vehicle Fuel Tanks
TB 55-46-1	Standard Characteristics (Dimensions, Weight, and Cube) for Transportability of Military Vehicles and Other Outsized/Overweight Equipment.
TB 750-651	Use of Antifreeze Solutions, Antifreeze Extender, Cleaning Compounds, and Test Kit in Engine Cooling Systems

A-8. TECHNICAL MANUALS.

TM 3-4230-214-12&P	Decontaminating Apparatus, Portable, DS2, 1 1/2 Quart, ABC-M11
TM 3-6665-225-12	M-8 Chemical Alarm
TM 9-238	Deepwater Fording of Ordnance Material
TM 9-2610-200-14	Operator's, Unit, Direct Support, General Support Maintenance for Care, Maintenance, Repair, and Inspection of Pneumatic Tires and Inner Tubes
TM 9-4240-280-10	Operator's Manual for Mask, Chemical - Biological
TM 9-6140-200-14	Lead Acid Storage Batteries
TM 9-8662	Arctic Heater
TM 11-5820-498-12	Radio
TM 43-1043	Equipment Improvement Report and Maintenance Summary
TM 743-200-1	Storage and Material Handling
TM 746-10	Marking, Packing, and Shipment of Supplies and Equipment
TM 750-244-6	Procedures for Destruction of Tank Automotive Equipment to Prevent Enemy Use (U.S. Army Tank-automotive and Armament Command)
TM 9-2330-247-14&P	Operator's, Organizational, Direct Support, and General Support Maintenance Manual (Including Repair Parts and Special Tools Lists) For Chassis, Trailer: General Purpose, 3-1/2 Ton, 2-Wheel, M353
TM 9-6115-646-14&P	Operator, Unit, Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools Lists) Power Unit PU-495A/G and PU-495B/G, MEP-007A (100 KW 60 HZ) or MEP-007B (100 KW 60 HZ) Generator Set, M353 2-Wheel, 2-Tire Modified Trailer
TM 9-6115-647-14&P	Technical Manual Operator, Unit, Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools Lists) Power Unit PU-789/M, MEP-114A (30 KW 400 HZ) Generator Set, M353 2-Wheel, 2-Tire, Modified Trailer

A-9. WEB SITES.

http://www.logsa.army.mil	Logistical Support Activity (LOGSA)
http://www.tea.army.mil	Military Traffic Management Command (MTMC)
http://www.tacom.army.mil	US Army Tank-automotive and Armaments Command (TACOM)

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE

TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	FROM: *(Activity and location) (Include ZIP Code)*
AMSTA-LC-CI TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630	**Your mailing address**

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	Title
TM 5-2420-230-10	01 oct 2003	Operator's Manual for Interim High-Mobility Engineer Excavator (IHMEE)

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Provide exact wording of recommended changes, if possible.)*
		2-115	**(14)(d)**			**"Push down inner boom control lever (6) to retract outer boom cylinder completely" should read "Push down outer boom control lever (6) to retract outer boom cylinder completely"**

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	**FROM:** *(Activity and location) (Include ZIP Code)*	DATE
AMSTA-LC-CI TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630		

PART II - REPAIR PARTSAND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 5-2420-230-10	01 OCT 2003	Operator's Manual for Interim High-Mobility Engineer Excavator (IHMEE)

PAGE NO.	COLM NO.	LINE NO.	FEDERAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III - REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more blank space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

USAPPC V3.00